



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/686,189	10/14/2003	Steven J. Visco	PLUSP027	3774

22434 7590 10/12/2006  
BEYER WEAVER & THOMAS, LLP  
P.O. BOX 70250  
OAKLAND, CA 94612-0250

EXAMINER
----------

CANTELMO, GREGG

ART UNIT	PAPER NUMBER
----------	--------------

1745

DATE MAILED: 10/12/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 10/686,189	<b>Applicant(s)</b> VISCO ET AL.	
	<b>Examiner</b> Gregg Cantelmo	<b>Art Unit</b> 1745	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 10 August 2006.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-72 is/are pending in the application.
- 4a) Of the above claim(s) 22-24,26,27,29 and 31-72 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-21 and 28 is/are rejected.
- 7) ☒ Claim(s) 25 and 30 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 14 October 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date <u>See Office Action</u> . | 6) <input type="checkbox"/> Other: _____  |

**DETAILED ACTION**

***Election/Restrictions***

1. Applicant's election without traverse of claims 1-20, 25, 28 and 30 in the reply filed on August 10, 2006 is acknowledged. Claims 21-24, 26, 27, 29 and 31-72 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected inventions, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on August 10, 2006.

***Priority***

2. Applicant's claim to U.S. provisional application serial number 60/418,899, filed October 15, 2002, is acknowledged.

***Information Disclosure Statement***

3. The information disclosure statements filed February 23, 2004; October 1, 2004; January 28, 2005; November 21, 2005; March 16, 2006; May 22, 2006; June 8, 2006 and July 17, 2006 have been placed in the application file and the information referred to therein has been considered as to the merits. With respect to the information disclosure statement filed July 31, 2006, the citation of U.S. Patent Application Publication No. 2001/041294 A1 to Chu et al. is incorrect. It appears that this document should be U.S. Patent Application Publication No. 2001/0041294 A1 to Chu et al. and this prior art patent application publication has been cited on the enclosed Form PTO-892. With respect to EP 0111213A2, the corresponding reference provided, in the absence of a statement of relevance or English abstract, does not appear to be relevant and has not been considered.

***Drawings***

4. The drawings received October 14, 2003 are acceptable for examination purposes.

***Specification***

5. The disclosure is objected to because of the following informalities: the specification references various U.S. Patent Applications (see page 17, for example) at least some have which have since matured into corresponding U.S. patents (such as U.S. Patent Application No. No. 10/189,098, now U.S. Patent No. 6,991,662). Applicant is required to update the status of each U.S. Patent Application to their respective U.S. Patent numbers throughout the disclosure. Appropriate correction is required.

***Claim Objections***

6. Claim 4 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. Claim 3, to which claim 4 is dependent upon, already recites that the second material is the sole electrolyte. Thus by reciting the presence of an electrolyte in the battery cell as in claim 4, the claim fails to further limit claim 3 since the electrolyte is already claimed.

***Claim Rejections - 35 USC § 112***

7. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Art Unit: 1745

Claims 18, 19 and 25 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The composite reaction product of Li with  $C_3N$  is not disclosed by the original specification and constitutes new matter.

8. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 4, 12, 18, 19 and 25 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

- a. Claim 4 recites the limitation "the structure" in line 1. There is insufficient antecedent basis for this limitation in the claim. The claim is unclear as to what components from claim 1, whether all or some, are held to be defined as "the structure". Clarification is requested;
- b. Claim 12 is not commensurate in scope with claim 1 with respect to the ionic conductivity. In claim 1, the claim requires that the ionic conductivity is at least  $10^{-7}$  S/cm. Claim 12 states that the ionic conductivity is about  $10^{-7}$  S/cm. The term about in claim 10 is not coextensive in scope with the term "at least" as required in claim 1. Thus the ionic conductivity of claim 12 includes a range beyond that of claim 1. Applicant is advised to amend claim 12 so that the term "about  $10^{-7}$  S/cm" is changed to "at least  $10^{-7}$  S/cm" to overcome this rejection;

Art Unit: 1745

c. Claims 18, 19 and 25 are indefinite. The composite reaction product of Li with  $C_3N$  is not understood. It is possible that Applicant intended this recitation to mean The composite reaction product of Li with  $Cu_3N$  in conjunction with the supported disclosure in the instant application. For purposes of expediting prosecution, the claims have been interpreted as intending to recite the composite reaction product of Li with  $Cu_3N$ . Furthermore the claimed language is unclear as to whether or not it is claiming the reactants or products. It would appear that the first layer is not Li with  $Cu_3N$  but the product from a reaction of the two resulting in  $Li_3N$  and Cu (see page 15). Clarification is requested.

***Claim Rejections - 35 USC § 102***

9. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 3-6, 8, 11, 12 and 15-21 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 5,314,765 (Bates '765) as evidenced by the enclosed property listing sheet for Lithium Phosphorous Oxynitride ("Lipon") Electrolyte properties.

While a species election has been made by Applicant, since the particular species to the first material was not found in the prior art of record, this species has been deemed allowable. However as to the broader claimed invention, at least a

Art Unit: 1745

remainder of the materials claimed are taught by the prior art of record, and in particular, anticipated by Bates.

Bates '765 discloses a lithium anode 42 having a composite protective layer 48 provided on the surface of the anode 42 (Fig. 1 and col. 3, ll. 4-5). The composite protective layer 48 includes a first layer 50 of lithium nitride and a second layer 52 of LiPON (col. 3, ll. 3-22). LiPON is known to have an ionic conductivity of  $10^{-6}$  S/cm at 25 °C as evidenced by the enclosed data sheet for LiPON (Fig. 2 as applied to claim 1).

With respect to claims 3 and 4, pending clarification of the 112 2<sup>nd</sup> paragraph rejection of claims 3 and 4. In one embodiment of the instant application the battery includes an additional electrolyte 46 (as applied to claims 3 and 4).

LiPON is known to have an ionic conductivity of  $10^{-6}$  S/cm at 25°C as evidenced by the enclosed data sheet for LiPON (Fig. 2 as applied to claims 5 and 6). Note that the term about is not defined by the claim and thus is inclusive of the inherent value of LiPON, being  $10^{-6}$  S/cm (as applied to claim 6).

The thickness of the first material is from about 0.05-0.1 micrometer (col. 3, ll. 10-14 as applied to claim 8).

The thickness of the second material is from about 0.1-0.5 micrometer (col. 3, ll. 118-22 as applied to claim 11) and being LiPON, has an ionic conductivity of  $10^{-6}$  S/cm at 25°C (as applied to claim 12).

The active material is lithium, as discussed above (applied to claim 15-17).

The first material is Li<sub>3</sub>N, as discussed above (applied to claims 18 and 19).

Art Unit: 1745

The second material is LiPON, as discussed above (applied to claims 20 and 21).

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).



Art Unit: 1745

10. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bates '765 in view of either U.S. Patent No. 5,569,520 (Bates '520) or U.S. Patent No. 6,025,094 (Visco).

The teachings of Bates '765 have been discussed above and are incorporated herein.

The difference between Bates '765 and claim 2 is that Bates does not teach of providing a current collector.

While Bates '765 does not expressly show or teach of current collectors, the presence of such would be a requirement of the device in order to effectively transfer electric current between the battery and a load.

Bates '520 teaches of the use of such current collectors 96 (Fig. 11) as does Visco who teaches that the negative electrode is spaced from the positive electrode, and both electrodes may be in material contact with an electrolyte separator. Current collectors contact both the positive and negative electrodes in a conventional manner and permit an electrical current to be drawn by an external circuit. In a typical cell, all of the components will be enclosed in an appropriate casing, plastic for example, with only the current collectors extending beyond the casing. Thereby, reactive elements, such as sodium or lithium in the negative electrode, as well as other cell elements are protected (paragraph bridging columns 13 and 14).

Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the teachings of Bates '765 by providing a

Art Unit: 1745

current collector to the opposite side of the anode since it would have provided the requisite means to permit an electrical current to be drawn by an external circuit or load.

11. Claims 3 and 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bates '765 in view of U.S. Patent No. 5,338,625 (Bates '625).

The teachings of Bates '765 have been discussed above and are incorporated herein.

With respect to claims 3 and 4, pending clarification of the 112 2<sup>nd</sup> paragraph rejection of claims 3 and 4. In one embodiment of the instant application the battery includes an additional electrolyte 46 (as applied to claims 3 and 4). Thus assuming that claim 4 does require two distinct electrolytic materials, Bates '765 is held to teach this and thus is the epitome of obviousness. However since claim 4 is dependent upon claim 3 and since the particular claimed arrangement is indefinite, claims 3 and 4 are further rejected under 35 U.S.C. 103(a).

The difference between Bates '765 and claim 3 is that Bates '765 does not teach of the second material being the sole electrolyte.

LiPON is a well known electrolyte for lithium batteries and is known to function as an excellent electrolytic material as taught by Bates '625.

Thus initially it would have been obvious to employ LiPON as the electrolytic layer 46 of Bates '765 since it would have provided an electrolyte having improved ionic conductivity which is not-reactive to the anode.

Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the teachings of Bates '765 by selecting the

Art Unit: 1745

electrolyte layer 46 to be LiPON since it would have provided an electrolyte having improved ionic conductivity which is not-reactive to the anode.

Given that LiPON is a recognized advantageous electrolyte and furthermore in light of the fact that layer 52 of the composite layer 48 is also LiPON, the combination of teachings of the art would logically and reasonably lead one of ordinary skill in the art to provide the LiPON layer 48 of Bates '765 as the sole electrolyte of the battery since it is known that LiPON can clearly function as such and provides an electrolyte which would be non-reactive to the lithium anode.

12. Claims 7, 20 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bates '765 in view of U.S. Patent No. 6,485,622 (Fu).

The teachings of Bates '765 have been discussed above and are incorporated herein.

In the event that the term about is deleted from claim 6 in attempt to define the range over the 102 rejection of Bates '765 above, it is held that the range would still be obvious for the reasons set forth herein.

The differences between Bates '765 and claims 7, 20 and 28 are that Bates '765 does not teach of the second material having an ionic conductivity between  $10^{-5}$  S/cm and  $10^{-4}$  S/cm (claim 7) or of the second material being the ion-conducting glass ceramic as defined in claim 20/28.

Fu teaches that the same lithium ion conductive glass-ceramic material is known in the art for use in lithium electrochemical cells (abstract). These materials include ionic conductivities of  $10^{-4}$  S/cm (Table 2).

Art Unit: 1745

The composition has an increased ionic conductivity as well as enhanced thermal stability within electrochemical devices.

Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the teachings of Bates '765 by selecting the second material to be the lithium ion conductive glass-ceramic material taught by Fu since it would have provided a material which provided both protection to the anode as well as increased the ionic conductivity of the protection composite in the cell. The selection of a known material based on its suitability for its intended use supported a prima facie obviousness determination in *Sinclair & Carroll Co. v. Interchemical Corp.*, 325 U.S. 327, 65 USPQ 297 (1945) See also *In re Leshin*, 227 F.2d 197, 125 USPQ 416 (CCPA 1960). MPEP § 2144.07.

13. Claims 9 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bates '765.

The teachings of Bates '765 have been discussed above and are incorporated herein.

The difference between Bates '765 and claims 9 and 10 is that Bates does not teach of the thickness of the first layer being about 0.2-1 micron (claim 9) or further about 0.25 micron (claim 10).

Bates '765 discloses a first material having a thickness of about 0.05-0.1 micron as discussed above. This overlaps the disclosed acceptable range of thicknesses used in the instant application and there is no apparent criticality and unexpected results apparently associated with the slightly larger thicknesses of claims 9 and 10. Generally,

Art Unit: 1745

differences in ranges will not support the patentability of subject matter encompassed by the prior art unless there is evidence indicating such ranges is critical. In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980). In re Aller, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955). In re Hoeschele, 406 F.2d 1403, 160 USPQ 809 (CCPA 1969). It has been held that when the difference between a claimed invention and the prior art is the range or value of a particular variable, then a prima facie rejection is properly established when the difference in the range or value is minor. Titanium Metals Corp. of Am. v. Banner, 778 F.2d 775, 783, 227 USPQ 773, 779 (Fed. Cir. 1985).

14. Claims 13 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bates '765 in view of Fu, of record.

The teachings of Bates '765 have been discussed above and are incorporated herein.

The differences between Bates '765 and claims 13 and 14 are that Bates does not teach of the second material thicknesses as claimed nor that the second material has an ionic conductivity between  $10^{-4}$  S/cm and  $10^{-3}$  S/cm.

Fu teaches that the same lithium ion conductive glass-ceramic material is known in the art for use in lithium electrochemical cells (abstract). These materials include ionic conductivities of  $10^{-4}$  S/cm (Table 2).

The composition has an increased ionic conductivity as well as enhanced thermal stability within electrochemical devices.

Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the teachings of Bates '765 by selecting the

Art Unit: 1745

second material to be the lithium ion conductive glass-ceramic material taught by Fu since it would have provided a material which provided both protection to the anode as well as increased the ionic conductivity of the protection composite in the cell. The selection of a known material based on its suitability for its intended use supported a prima facie obviousness determination in *Sinclair & Carroll Co. v. Interchemical Corp.*, 325 U.S. 327, 65 USPQ 297 (1945) See also *In re Leshin*, 227 F.2d 197, 125 USPQ 416 (CCPA 1960). MPEP § 2144.07.

With respect to the claimed thicknesses: Bates '765 discloses a first material having a thickness of about 0.1 and 0.5 micron as discussed above. This overlaps the disclosed acceptable range of thicknesses used in the instant application and there is no apparent criticality and unexpected results apparently associated with the slightly larger thicknesses of claims 13 and 14. Generally, differences in ranges will not support the patentability of subject matter encompassed by the prior art unless there is evidence indicating such ranges is critical. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980). *In re Aller*, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955). *In re Hoeschele*, 406 F.2d 1403, 160 USPQ 809 (CCPA 1969). It has been held that when the difference between a claimed invention and the prior art is the range or value of a particular variable, then a prima facie rejection is properly established when the difference in the range or value is minor. *Titanium Metals Corp. of Am. v. Banner*, 778 F.2d 775, 783, 227 USPQ 773, 779 (Fed. Cir. 1985).

### ***Double Patenting***

15. A rejection based on double patenting of the "same invention" type finds its support in the language of 35 U.S.C. 101 which states that "whoever invents or

Art Unit: 1745

discovers any new and useful process ... may obtain a patent therefor ..." (Emphasis added). Thus, the term "same invention," in this context, means an invention drawn to identical subject matter. See *Miller v. Eagle Mfg. Co.*, 151 U.S. 186 (1894); *In re Ockert*, 245 F.2d 467, 114 USPQ 330 (CCPA 1957); and *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970).

A statutory type (35 U.S.C. 101) double patenting rejection can be overcome by canceling or amending the conflicting claims so they are no longer coextensive in scope. The filing of a terminal disclaimer cannot overcome a double patenting rejection based upon 35 U.S.C. 101.

16. Claims 1-7, 15-20 and 28 are provisionally rejected under 35 U.S.C. 101 as claiming the same invention as that of claims 1-12 and 14 of copending Application No. 10/731,771. This is a provisional double patenting rejection since the conflicting claims have not in fact been patented.

Copending Application No. 10/731,771 claims an electrochemical device component, comprising: an active metal electrode having a first surface and a second surface; a protective composite on the first surface of the electrode, the composite comprising, a first material layer in contact with the electrode, the first material layer being ionically conductive and chemically compatible with the active metal; and a second material in contact with the first material, the second material being substantially impervious, ionically conductive and chemically compatible with the first material; wherein the ionic conductivity of the composite is at least  $10^{-7}$  S/cm (claim 1 as applied to instant claim 1). The elected species materials in both applications are identical in that the first material is the composite reaction product of lithium metal with  $\text{Cu}_3\text{N}$ , the second material is the ion conducting glass of claim 14 in the instant application and claim 28 of the copending application; and the active material is lithium.

Claim 1 of copending Application No. 10/731,771 differs from claim 1 of the instant application only in the recitation of the first material being a first material layer and in the event that the structure of the claims are in fact distinguishable from one another the claims would further be obvious over one another.

The component further comprises a current collector on the second surface of the active metal electrode (claim 2 as applied to instant claim 2).

The second material comprises the sole electrolyte in a subsequently formed battery cell (claim 3 as applied to instant claim 3).

The subsequently formed battery cell further comprises an electrolyte (claim 4 as applied to instant claim 4).

The ionic conductivity of the second material is between about  $10^{-6}$  S/cm and  $10^{-3}$  S/cm (claim 5 as applied to instant claims 5 and 6).

The ionic conductivity of the second material is between about  $10^{-5}$  S/cm and  $10^{-4}$  S/cm (claim 6 as applied to instant claims 6 and 7).

The thickness ratio of the first material to the second material in the composite is less than 1-1000 (claim 7 as applied to instant claims 9-11).

The active metal of the electrode is lithium (claim 8 as applied to instant claims 15-17).

The first material is the composite reaction product of lithium metal with  $\text{Cu}_3\text{N}$  (claims 9 and 10 as applied to instant claims 18 and 19).

The second material is identical in scope (claim 14 as applied to instant claims 20 and 28).



Art Unit: 1745

17. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

18. Claims 1-20 and 28 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims and 1-12 and 14 of copending Application No. 10/731,771. Although the conflicting claims are not identical, they are not patentably distinct from each other.

Copending Application No. 10/731,771 claims an electrochemical device component, comprising: an active metal electrode having a first surface and a second surface; a protective composite on the first surface of the electrode, the composite comprising, a first material layer in contact with the electrode, the first material layer being ionically conductive and chemically compatible with the active metal; and a second material in contact with the first material, the second material being substantially impervious, ionically conductive and chemically compatible with the first material;

Art Unit: 1745

wherein the ionic conductivity of the composite is at least  $10^{-7}$  S/cm (claim 1 as applied to instant claim 1). The elected species materials in both applications are identical in that the first material is the composite reaction product of lithium metal with  $\text{Cu}_3\text{N}$ , the second material is the ion conducting glass of claim 14 in the instant application and claim 28 of the copending application; and the active material is lithium.

Claim 1 of copending Application No. 10/731,771 differs from claim 1 of the instant application only in the recitation of the first material being a first material layer and in the event that the structure of the claims are in fact distinguishable from one another the claims would further be obvious over one another.

The component further comprises a current collector on the second surface of the active metal electrode (claim 2 as applied to instant claim 2).

The second material comprises the sole electrolyte in a subsequently formed battery cell (claim 3 as applied to instant claim 3).

The subsequently formed battery cell further comprises an electrolyte (claim 4 as applied to instant claim 4).

The ionic conductivity of the second material is between about  $10^{-6}$  S/cm and  $10^{-3}$  S/cm (claim 5 as applied to instant claims 5 and 6).

The ionic conductivity of the second material is between about  $10^5$  S/cm and  $10^{-4}$  S/cm (claim 6 as applied to instant claims 6 and 7).

The thickness ratio of the first material to the second material in the composite is less than 1-1000 (claim 7 as applied to instant claims 9-11).

The active metal of the electrode is lithium (claim 8 as applied to instant claims 15-17).

The first material is the composite reaction product of lithium metal with  $\text{Cu}_3\text{N}$  (claims 9 and 10 as applied to instant claims 18 and 19).

The second material is identical in scope (claim 14 as applied to instant claims 20 and 28).

With respect to the thickness limitations of claims 8-14: generally, differences in ranges will not support the patentability of subject matter encompassed by the prior art unless there is evidence indicating such ranges is critical. In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980). In re Aller, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955). In re Hoeschele, 406 F.2d 1403, 160 USPQ 809 (CCPA 1969).

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

19. Claims 1-20 and 28 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-14 and 23-43 of copending Application No. 10/772,228. Although the conflicting claims are not identical, they are not patentably distinct from each other.

Copending Application No. 10/772,228 claims an electrochemical device component, comprising: an active metal electrode having a first surface and a second surface; a protective composite on the first surface of the electrode, the composite comprising, a first material layer in contact with the electrode, the first material layer being ionically conductive and chemically compatible with the active metal; and a

Art Unit: 1745

second material in contact with the first material, the second material being substantially impervious, ionically conductive and chemically compatible with the first material; wherein the ionic conductivity of the composite is at least  $10^{-7}$  S/cm (claims 1, 2, 23 and 24 as applied to instant claim 1).

The component further comprises a current collector on the second surface of the active metal electrode (claims 4 and 24 as applied to instant claim 2).

The second material comprises the sole electrolyte in a subsequently formed battery cell (claim 26 as applied to instant claim 3).

The subsequently formed battery cell further comprises an electrolyte (claim 23 as applied to instant claim 4).

The ionic conductivity of the second material is between about  $10^{-6}$  S/cm and  $10^{-3}$  S/cm (claim 5 as applied to instant claim 5).

The ionic conductivity of the second material is between about  $10^5$  S/cm and  $10^{-4}$  S/cm (claims 6 and 7 as applied to instant claims 6 and 7).

The thickness ratio of the first material to the second material in the composite is less than 1-1000 (claims 2 as applied to instant claim 7).

The active metal of the electrode is lithium (claim 8 as applied to instant claims 15-17).

The first material is selected from the same Markush group (claims 9 and 10 as applied to instant claims 18 and 19).

With respect to the thickness limitations of claims 8-14: generally, differences in ranges will not support the patentability of subject matter encompassed by the prior art

Art Unit: 1745

unless there is evidence indicating such ranges is critical. In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980). In re Aller, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955). In re Hoeschele, 406 F.2d 1403, 160 USPQ 809 (CCPA 1969).

The second material is identical in scope (claim 14 as applied to instant claims 20 and 28).

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

#### ***Allowable Subject Matter***

20. Claims 25 and 30 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The elected species of the first material, composite reaction product of lithium metal with  $\text{Cu}_3\text{N}$  is neither taught nor reasonably suggested by the prior art of record. While Bates employs  $\text{Li}_3\text{N}$ , this layer is formed by reactive sputtering and not by a reaction product of lithium metal with  $\text{Cu}_3\text{N}$ . The reaction product of the instant claims appears to result in a composite  $\text{Li}_3\text{N}$ /copper metal first barrier material which is materially different from that of Bates.


#### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gregg Cantelmo whose telephone number is 571-272-1283. The examiner can normally be reached on Monday to Thursday, 8:00-5:30.

Art Unit: 1745

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Pat Ryan can be reached on 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

  
gc  
Sept 21, 2006

Gregg Cantelmo  
Primary Examiner  
Art Unit 1745